SOIL ASSOCIATIONS OF BROWN COUNTY, ILLINOIS

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CONTENTS

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A SOIL ASSOCIATION consists of soils that commonly occur together in a characteristic pattern. The soils of an association are usually similar in surface color and general slope class but they differ in other properties such as internal drainage.

The general soil map of Brown County at the back of this circular shows the boundaries between soil associations. It is useful in comparing different parts of the county and in locating areas suitable for particular uses but it does not give detailed information for individual farms or fields.

The soil association areas are shown on the map in color and are also identified by letter (A through J). To help you locate a particular tract, township boundaries and section numbers as well as cultural features such as roads, buildings, and towns are shown in the background. When you have identified the soil association areas on a certain tract, you may refer to the text, tables, and figures to obtain more information about the soils of Brown County, their characteristics, estimated yields, and suitability for specific uses.

GENERAL FEATURES OF BROWN COUNTY

Land Use

The first settlers of Brown County found timber growing on about 80 percent of the land and prairie vegetation on the remaining 20 percent. The native vegetation gave way to the axe and plow as agriculture became the major industry of the county. Practically all of the prairie land is cultivated but some areas that were originally wooded are still in forest.

In 1967 about 46 percent of the 196,488 acres in the county was in cropland; 29 percent, in permanent pasture; and 19 percent, in forests. Farmsteads, urban areas, and miscellaneous land use accounted for the other 6 percent. Row crops — largely corn and soybeans — were grown on over 60 percent of the cropland acreage; and small grains — oats and wheat — on about 11 percent. The rest of the cropland was used for hay, rotation pasture, and conservation purposes. (Source: *Illinois Soil and Water Conservation Needs Inventory*, 1970.)

Much of the crop production is marketed in the form of hogs and beef cattle. In 1964, 48 percent of the farmers' total cash receipts came from hogs; 12 percent, from cattle; 5 percent, from other livestock; and 35 percent, from crops. (Source: Bulletin C-21, Illinois Cooperative Crop Reporting Service.)

About 60 percent of the cropland in Brown County is devoted to row crops. This picture was taken on an area of Soil Association A, which lies mainly in the west-central and central part of the county. (Fig. 1)

Climate

Brown County has the continental climate typical of Illinois. Temperatures range from summer highs of more than 100° F. to winter lows below 0° F. Summers are warm, but periods above 100° F. are seldom prolonged. Although winter temperatures have been as low as −20° F., below-zero temperatures occur only about four times a year.

Annual precipitation at Mt. Sterling averages about 37 inches. Monthly precipitation averages less than 2 inches from December through February. It averages more than 4 inches from April through June, when crops offer little protection from runoff. As a result, water erosion is often severe on sloping, unprotected fields.

Warm season (April through September) rainfall averages about 24 inches. Soil moisture stored during

the fall, winter, and spring is important during July and August, when crop demands are greater than the average monthly rainfall.

The frost-free season is the number of days between the last freeze (32° F. or below) in the spring and the first freeze in the fall. In Brown County this period is normally 185 days, extending from April 18 to October 21. However, there is a 10-percent chance that the last spring freeze will be after May 5 and that the first fall freeze will be before October 5.

(This section was adapted from material prepared by William L. Denmark, State Climatologist.)

FACTORS THAT CAUSE DIFFERENCES IN BROWN COUNTY SOILS

The soils of Brown County vary from place to place even within the same field. Some differences are easily seen. For example, the dark, nearly level soils near Timewell contrast sharply with the light-colored, sloping soils near Siloam Springs. These differences influence the use that can be made of the soils. Other differences that also influence soil use are less easily seen. Recognizing and understanding soil differences is important for efficient use and conservation of the soil resources of Brown County.

Soils are the result of numerous chemical, physical, and biological processes. The factors that control these processes are: (1) the nature of the soil parent materials; (2) climatic characteristics, primarily rainfall and temperature; (3) the kind of plant and animal life, especially the native vegetative cover, associated with the soil; (4) the topography or slope of the area, particularly as it influences the moisture condition of the soil and its natural drainage; and (5) the amount of time the soil development processes have been active and the rate or intensity of these processes. These major factors of soil formation acting in various combinations account for the differences among soils. The influences of these factors on the soils of Brown County are briefly discussed in the following sections.

Geology and Soil Parent Material

Brown County is located on the extreme western border of the Illinois bedrock basin. The bedrock is of Pennsylvania age and consists of layers of sandstone, shale, limestone, and coal. In preglacial times, the bedrock surface was subjected to long periods of weathering. The bedrock was truncated or beveled by erosion so that several strata may be exposed on a single slope. Although the bedrock was buried by more recent deposits in much of Brown County, bedrock is exposed in quarries and along many stream valleys (such as McKee Creek in southwestern Brown County).

The bedrock surface was covered by glaciers during three glacial periods. The last of these in Brown County — the Illinoian — covered the entire county and left a covering of glacial till as it retreated. The glacial till in Brown County usually varies from 50 to 100 feet in thickness. During one of the later advances of the Illinoian glaciers, the ice moved up the McKee Creek and LaMoine River valleys and blocked these streams to form a series of glacial lakes in which clay, silt, sand, and gravel were deposited.

During the Sangamon interglacial period, which followed the Illinoian glacial period, the glacial till and lake deposits were exposed to a long period of weathering and soil formation. Highly weathered soils with a high clay content formed during this period.

Although ice sheets did not re-enter the county after the Sangamon interglacial period, later Wisconsinan glaciers to the north provided a source of sediments for Brown County soils. During times when the Wisconsinan glaciers were melting, the melt waters carried large quantities of sediment that were deposited in wide alluvial flood plains of rivers such as the Illinois and Mississippi. During drier periods silty material called loess was blown from the flood plains and covered the upland surface of the Illinoian till plain. Two sheets of the loess buried the older landscape. The first layer, called Roxana loess, was pinkish in color. It was covered by a thicker deposit of gray or tan Peoria loess. Total loess thickness is about 6 feet in the western part of the county but may be more than 25 feet on the more level uplands near the bluffs of the Illinois River valley. Important mineralogical variations in the loess are related to the origin of the flood plain sediments from which the loess originated.

Loess is the major parent material of soils on the nearly level to moderately sloping upland landscapes. However, on very strongly sloping areas, the loess may be thin or absent because of erosion. On these areas weathered Illinoian drift, Illinoian glacial till, or underlying bedrock may crop out and serve as soil parent material.

Soils of Association H are formed from alluvial sediments on nearly level to gently sloping high terraces along the Illinois and LaMoine Rivers and McKee Creek. These terraces are remnants of earlier high water levels. Alluvial sediments also form the parent material for soils developed in the Illinois

River bottomland (Area I) and the bottomlands of its major tributaries (Area J). This material was largely derived from the upland loess and till by erosion during valley development and was deposited on the bottomlands.

Climate and Vegetation

Climate is an important factor in soil formation. It influences not only the type of native vegetation that grows, but also the chemical and physical weathering of the parent materials. Post-glacial environments in Illinois have included several wet and dry cycles which affect both the adaptation of vegetation and the stability of the soil landscapes. An early cool, moist period favored conifer forests. This period was followed by a gradual warming trend, ending about 3,000 years ago, which led to the establishment of prairie grasses. The drier weather accompanying this change probably favored unstable landscape conditions that allowed erosion of the previously forested soils.

During the past 3,000 years, the county's climate has probably been much as it is now — that is, subhumid and temperate, with average annual precipitation of about 37 inches; a mean annual temperature of about 55° F.; and a frost-free period averaging 185 days. These conditions led to a resurgence of forest on the more rolling, unstable portions of the county. In these sloping areas, as well as on narrow, flat divides, trees have had the major vegetative influence on the soils. In the more level areas in the western and central parts of the county, soils formed mainly under prairie grasses (Association A).

The soils in Association A, because of the grass vegetation under which they formed, are dark, with a high organic matter content and physical and chemical characteristics favorable for plant growth. The soils that developed under forest vegetation have light-colored surface horizons, low organic matter, and less favorable physical and chemical characteristics than the soils in Association A.

Topography and Drainage

Topography, or the slope of a landscape, has a large influence on the amount of rainfall or snow melt that will run off, collect in depressions, or pass into and through a soil profile. These factors help to determine the degree of erosion or soil deposition.

The amount of water in and passing through the soil profile also determines natural soil drainage, which in turn affects the rate of subsoil weathering and the development of subsoil colors. Well-drained soils have yellow or yellowish-brown subsoils; somewhat poorly drained soils have mottled gray and brown subsoils; and poorly drained soils have gray subsoils.

Soils in Brown County that are on nearly level to gently sloping topography usually have somewhat poor or poor natural drainage (Soil Areas A, B, H, I, and J). Soils on sloping, strongly sloping, or steep topography usually have good drainage (Soil Areas C, D, E, F, and G). However, some sloping and steep soils in areas C and D may have somewhat poor natural drainage because of the slow rate of water movement through the clayey glacial drift or bedrock.

Time for Soil Development

The effects of time on soil development are complicated by the interrelationships of age with the type of parent material, slope stability, type of native vegetation, and landscape position.

In Brown County most of the upland soils developed from the rather uniform, silt-sized loess that was deposited about 12,000 years ago. Since then, weathering, translocation, and accumulation have occurred.

The age and weathering of the soil on sloping areas depend upon the degree of truncation or beveling of the slope. On many of the steeper, drier slopes, erosion continually removes the soil as it forms. The present soil, which is developing from relatively fresh Illinoian till, is therefore thin, weakly developed, and relatively unweathered.

On stable, less steep slopes, soils are more weathered and have more strongly developed horizons. Also, old, highly weathered soils may be found on some of the steeper slopes. The loess deposits were thin on these slopes and the soils have formed partly or entirely from Illinoian glacial till or bedrock. In several areas, dissection by present drainageways has exposed the old Sangamon soil, which formed before loess was deposited.

Amount and intensity of soil development is also related to the type of native vegetation. Soils under forest vegetation seem to develop more strongly than prairie soils of the same chronological age and parent material.

Soils on terraces or second bottomlands of Association Area H have formed from thin Peoria loess over older alluvial material. The upper parts of the soils are similar in age to those found in stable upland positions. The type of underlying alluvial material and natural drainage conditions, largely through their effects on water-holding capacity and permeability, have strongly influenced the degree of development of these soils.

Bottomland soils of Association Areas I and J are the youngest in terms of time and degree of develop-

Table 1. — Relationship of Parent Materials, Native Vegetation, Surface Color, Slope, and Natural Drainage Class of Brown County Soils

Soil association area	Parent material	Native vegetation	Surface color	Dominant slope (pct.)	Natural drainage class and soil series name			
					Poor	Somewhat poor	Moderately well	Well
A	Loess more than 5′ thick on weathered Illinoian till	Prairie	Dark	0–4	Virden	Ipava Herrick	Tama	Tama
		Prairie-forest	Mod. dark	0–4		Clarksdale	Sicily	Sicily
B	Loess more than 5′ thick on weathered Illinoian till	Forest	Light	0–4	Rushville	Keomah	Clinton	Clinton
C	Loess more than 5′ thick on weathered Illinoian till Clayey or loamy Illinoian till	Forest	Light	4–12			Clinton	Clinton
				7–12		Atlas Fishhook	Hickory	Hickory
		Prairie	Dark	7–12		Keller		
D	Loess more than 5′ thick on weathered Illinoian till	Forest	Light	12–18			Clinton	Clinton
	Loamy Illinoian till	Forest	Light	12–18			Hickory	Hickory
	Thin loess over shale bedrock	Forest	Light	>12			Marseilles	Gosport Marseilles
	Sandy loam and clay outwash	Forest	Light	>12			El Dara	
E	Loess more than 10′ thick on weathered Illinoian till	Forest	Light	0–4		Stronghurst	Rozetta	Fayette
F	Loess more than 10′ thick on weathered Illinoian till	Forest	Light	4–12 >12			Rozetta	Fayette Sylvan
G	Loess more than 10′ thick on weathered Illinoian till	Forest	Light	>12				Fayette Sylvan
	Loamy Illinoian till	Forest	Light	>12			Hickory	Hickory
	Thin loess over shale bedrock	Forest	Light	>12				Gosport
H	Loess over silty and sandy sediments	Prairie	Dark	0–4			Proctor	Proctor
		Prairie-forest	Mod. dark	0–4		Millbrook	Harvard	Harvard
		Forest	Light	0–4		Starks	Camden	Camden
	Sandy sediments	Prairie	Dark	0–4			Onarga	Onarga
I	Silty and clayey sediments in bottomlands of Illinois River	Prairie	Dark	0–2	Titus Sawmill	Lawson		
		Prairie-forest	Mod. dark	0–2	Darwin			
		Forest	Light	0–2		Wakeland		
J	Silty alluvial sediments	Forest	Light	0–2	Birds	Wakeland	Haymond	Haymond
	Sandy alluvial sediments	Forest	Light	0–2				Landes

ment. During flooding these areas have been and continue to be subjected to scouring and removal of material as well as deposition of fresh sediment. They have not had a long stable period for weathering and soil formation.

Relationships of parent material, native vegetation, slope, and natural soil drainage are shown for Brown County soils in Table 1. The characteristics of soil associations of Brown County will be discussed in the next section.

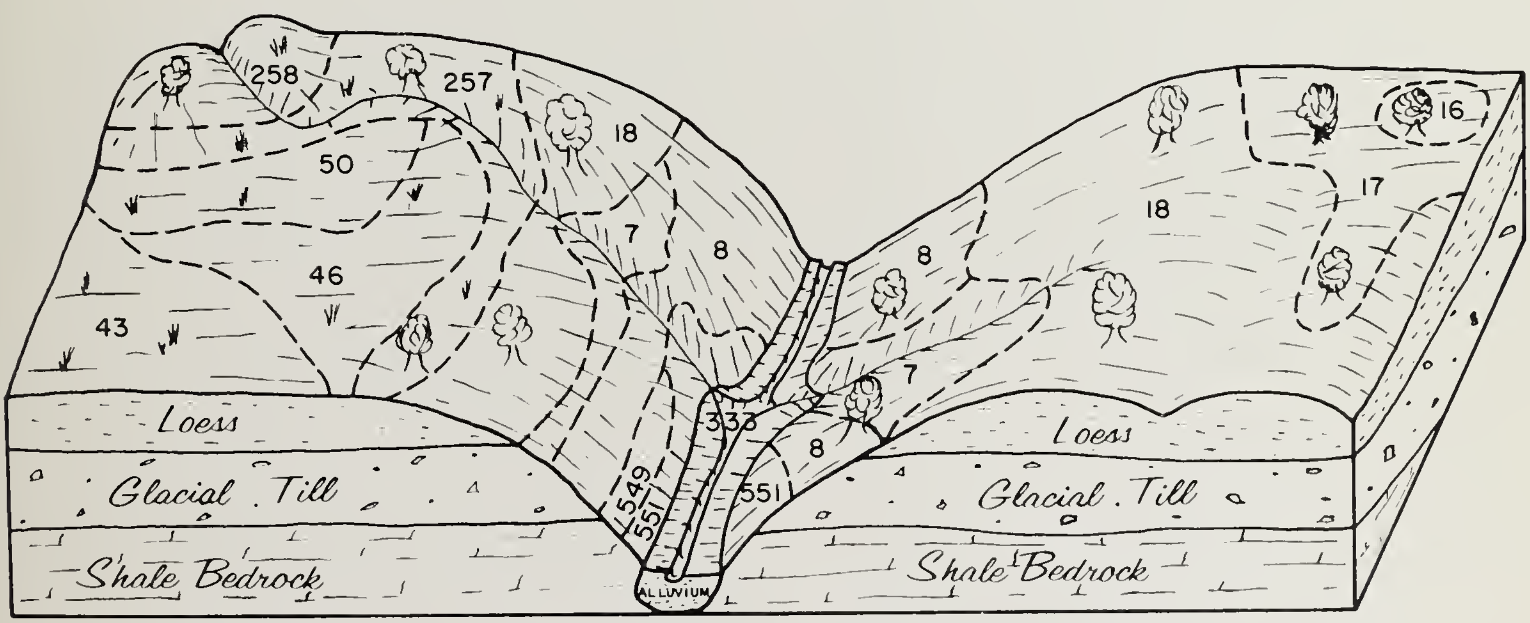
CHARACTERISTICS OF THE SOIL ASSOCIATIONS

A. Virden-Ipava-Clarksdale Association, 0-4 percent slopes. This association occupies about 12 percent of the county. Most of the association is nearly level to gently sloping, but a small area with 4-12 percent slopes lies about 1 mile northwest of Timewell. It is separated from the adjacent, more level area on the general soil map by a series of dots. This association lies primarily in the west-central and central part of the county, extending from the Adams County line eastward to Hersman, with narrow extensions to the northeast and southeast. Small areas lie southwest of Ripley, northwest of Cooperstown, east of Hersman, west of Buckhorn, and both northeast and southwest of Morrelville in the south-central part of the county. These soils are dark and formed from more than 5 feet of loess over clay loam glacial till (Fig. 2).

Virden soils occupy about 35 percent of the association. They are nearly level or depressional and are poorly drained. The surface layer is a black silt loam or silty clay loam. The subsoil is gray, mottled with yellow, and has a silty clay loam texture. The substratum is gray silty clay loam mottled with olive brown. If drained, Virden soils are well suited for cropland and are used extensively for the production of corn and soybeans. A high water table and susceptibility to frost heaving severely limit the use of Virden soils for building sites, septic tank filter fields, and most urban and recreational uses.

Ipava soils occupy about 25 percent of the association. They are nearly level to gently sloping and are somewhat poorly drained. The surface layer is a black to very dark brown silt loam; the subsoil, a light brownish-gray silty clay loam mottled with yellow and brown. The substratum is a light brownish-gray silt loam mottled with yellow and brown. Ipava soils are well suited for intensive production of row crops such as corn and soybeans. A seasonally high water table and susceptibility to frost heaving limit the use of Ipava soils for urban and recreational purposes.

Clarksdale soils, which occupy about 25 percent of



A	B	C	D
43 Ipava, 0-4%	16 Rushville, 0-2%	7 Atlas, 7-12%	8 Hickory, 12%
46 Herrick, 0-4%	17 Keomah, 0-4%	8 Hickory, 12%	18 Clinton, 7-12%
50 Virden, 0-2%	18 Clinton, 4-7%	18 Clinton, 7-12%	544 Marseilles, 7-12%
257 Clarksdale, 0-4%	257 Clarksdale, 0-4%		551 Gosport, 12%
258 Sicily, 4-12%			333 Wakeland, 0-2%

Soil landscape relationships of Soil Associations A, B, C, and D. (Fig. 2)

the association, are nearly level and gently sloping. They resemble Ipava soils in being somewhat poorly drained, but differ in having a moderately dark surface layer due to the influence of mixed prairie-forest vegetation. The surface layer is very dark gray silt loam which is underlain by a dark gray silt loam subsurface layer. The subsoil is grayish-brown silty clay loam mottled with gray, yellow, and brown. The substratum is gray silt loam mottled with yellow and brown. Clarksdale soils are well suited for intensive use as cropland. A seasonally high water table and susceptibility to frost heave limit their use for urban and recreational uses.

Minor soils, which make up about 15 percent of this association, include Herrick, Sicily, Tama, and others. Herrick soils lie only in the western part of the association, from the Adams County line to about 1 mile east of Timewell. They are dark-colored and somewhat poorly drained, with a silt loam surface layer, silty clay loam subsoil, and silt loam substratum. Water moves through Herrick soils more slowly than through Ipava soils. Sicily and Tama are similar to Clarksdale and Ipava, respectively, except that they are moderately well to well drained.

Soils of the Virden-Ipava-Clarksdale Association are intensively cropped to corn and soybeans. The somewhat poorly and poorly drained soils can be satisfactorily drained with tile. Their moderate to severe wetness hazard limits their use for most urban and recreational uses. The soils of the sloping area northwest of Timewell are moderately well and well drained but have a moderate to severe erosion hazard for cropland use. These more sloping soils are well suited for most urban, recreational, pasture, and forest uses.

B. Keomah-Clinton Association, 0-4 percent slopes. This association occupies about 19 percent of Brown County, being widely distributed on narrow ridge tops in the western two-thirds of the county. The soils are nearly level to gently sloping. They are light-colored and formed from more than 5 feet of loess over clay loam glacial till (Fig. 2).

Keomah soils occupy about 45 percent of the association. They are nearly level to gently sloping and are somewhat poorly drained. A dark gray silt loam surface layer lies over a grayish-brown silt loam subsurface layer. The subsoil is dark yellowish-brown silty clay loam mottled with gray. Water moves more slowly through Keomah soils than through soils of the Virden-Ipava-Clarksdale Association.

Clinton soils occupy about 40 percent of the association. They are gently sloping and are well and moderately well drained. A dark gray silt loam surface layer overlies a brown silt loam subsurface layer. The subsoil is mixed yellowish-brown and brown silty clay loam. The substratum is mixed yellowish-brown and olive-gray silt loam.

Minor soils, including Rushville, Clarksdale, and others, occupy about 15 percent of the association. Rushville soils are light-colored and poorly drained, with a silt loam surface and subsurface layer, a silty clay loam to silty clay subsoil, and a silt loam substratum. Clarksdale soils were described in the section on the Virden-Ipava-Clarksdale Association. Most soils of Association B, like those of the Virden-Ipava-Clarksdale Association, are cropped with cash grain crops such as corn and soybeans. Because of seasonally high water tables and moderately slow permeability, Keomah and Rushville have severe limitations for most urban and recreational uses. Clinton soils are less subject to seasonally high water tables and have slight to moderate limitations for most urban and recreational uses.

C. Clinton-Atlas Association, 4-12 percent slopes. This association occupies about 7 percent of the county. It is widely distributed in the northern third of the county, with a few areas also lying in the west-central and southwestern parts (Fig. 2). It is moderately to strongly sloping. Clinton soils formed from loess more than 5 feet deep; Atlas soils, from clayey glacial drift.

Clinton soils, which occupy about 65 percent of the association, are moderately to strongly sloping. They are described more completely in the section on Soil Association B.

Atlas soils occupy about 20 percent of the association, occurring mostly in the western half of the area. They are strongly sloping and are somewhat poorly drained. The surface horizon is brown to grayish-brown silt loam. The subsoil is grayish-brown silty clay and clay mottled with gray and brown. The substratum is mixed gray and yellowish-brown clay loam.

Minor soils, including Fishhook, Keller, Hickory, and others, occupy about 15 percent of the association. Fishhook soils are light-colored and somewhat poorly drained. The surface horizon is a silt loam and the subsoil and subsurface horizons are silty clay or clay. Keller soils are similar to Fishhook soils except that they have dark silt loam surface layers. Hickory soils will be described under Soil Association D, where they occur more extensively.

Pasture and woodland occupy a higher proportion of Association C than of Associations A and B. However, most areas of the Clinton-Atlas Association are used for cropland, with cash grain and mixed livestock farming predominating. Corn, soybeans, hay, and pasture are the main crops. Slight wetness,

strongly sloping topography, and very slow permeability limit the use of the soils in this association for most purposes. Erosion is more severe than in Association Areas A and B. The surface layers in many fields have been almost entirely removed by erosion.

D. Hickory-Clinton-Gosport Association, slopes greater than 12 percent. This is the most extensive association in Brown County, occupying about 35 percent of the land area and occurring widely in the western three-quarters of the county. It is moderately to very steep. Hickory soils formed in clay loam glacial drift, Clinton soils in more than 5 feet of loess, and Gosport soils in material weathered from shale bedrock (Fig. 2).

Hickory soils occupy about 40 percent of the association. They are moderately steep to very steep and are well or moderately well drained. Unless eroded, Hickory soils have a very dark grayish-brown surface horizon over a brown loam subsurface horizon. The subsoil and substratum are yellowish-brown clay loam, with gray and brown mottlings in the lower part of the subsoil and in the substratum. The moderately steep to very steep slopes severely limit the use of Hickory and most other soils of this association for cropland and for most urban and recreational purposes. However, these soils have few limitations for pasture, woodland, and wildlife.

Clinton soils occupy about 30 percent of the association. Moderately steep, they are more sloping than the Clinton soils in Soil Association B, but are otherwise similar.

Gosport soils make up about 20 percent of the association. They are steep or very steep, occurring downslope from Hickory soils, and are well drained. The surface layer of a Gosport soil is a dark grayish-brown silt loam; the subsoil, a yellowish-brown silty clay loam and silty clay. Shale bedrock lies just 15 to 20 inches beneath the surface. The shallow depth of bedrock and the steep topography severely limit the use of Gosport soils for most agricultural, recreational, and urban uses. Soil features are less limiting for woodland and wildlife uses.

Minor soils — Marseilles, El Dara, and others — occupy about 10 percent of the association. Marseilles soils are moderately well and well drained and have light-colored silt loam surface layers, silty clay loam subsoils, and clayey substrata derived from shale bedrock. El Dara soils occur mainly in the southwestern part of the county. They have sandy loam surface layers, sandy clay loam subsoils, and loamy and sandy substratum horizons.

The Hickory-Clinton-Gosport Association is used primarily for pasture and woodland. It is well suited for wildlife. Features such as steep slopes, slow permeability, and high clay content (of Gosport soils) severely limit the use of these soils for most agricultural, urban, and recreational purposes.

E. Rozetta-Fayette Association, 0-4 percent slopes. This association occupies about 3 percent of Brown County, lying on narrow ridge tops in the eastern third of the county and on small areas south of McKee Creek in the south-central part. It is nearly level to gently sloping. The soils are light-colored and have formed from more than 10 feet of loess over clay loam glacial till (Fig. 3).

Rozetta soils occupy about 45 percent of the association. They are nearly level to gently sloping and are moderately well drained. A very dark gray surface layer is underlain by a dark grayish-brown subsurface layer. The upper subsoil is dark yellowish-brown silty clay loam and the lower subsoil is brown silty clay loam mottled with gray and brown. The substratum is yellowish-brown silt loam.

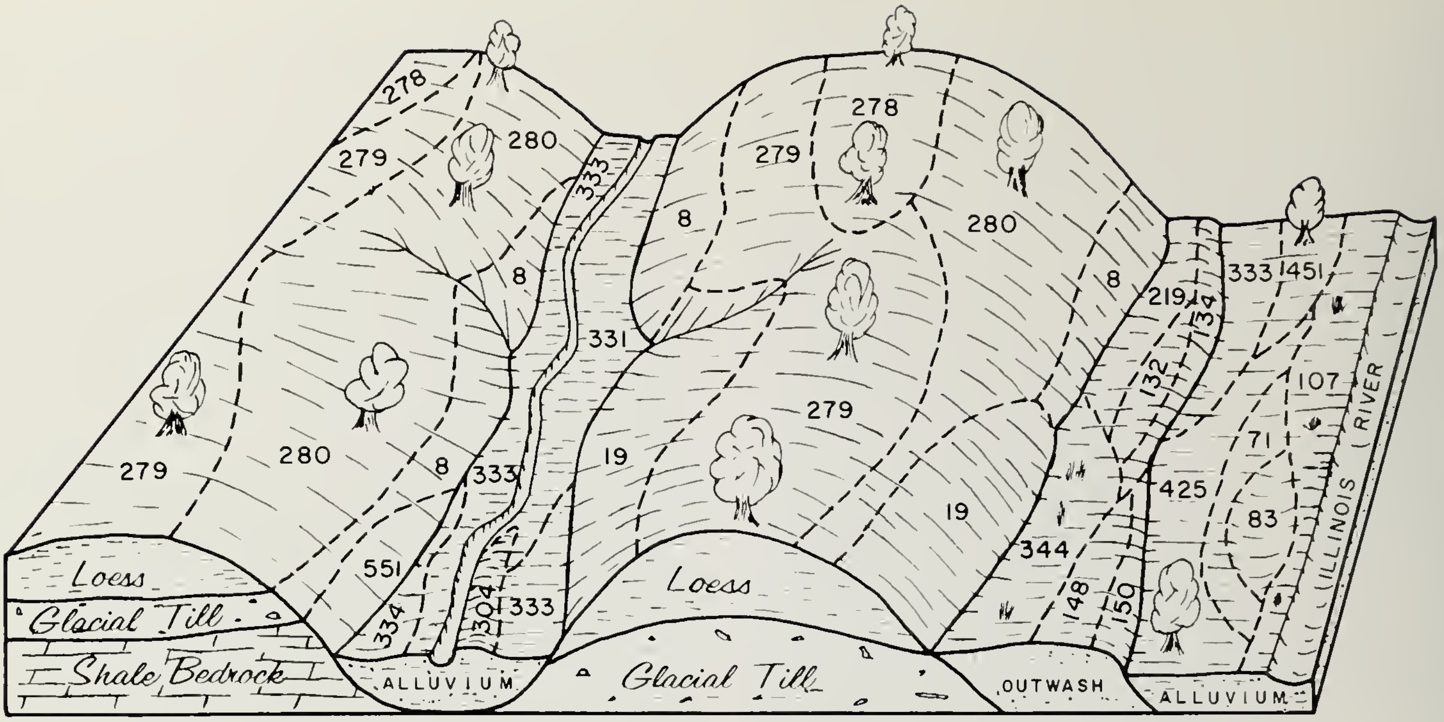
Fayette soils occupy about 35 percent of the area. They are gently sloping and well drained. A dark gray silt loam surface horizon lies over a dark grayish-brown silt loam subsurface layer. The subsoil is brown and yellowish-brown silty clay loam and is underlain by a yellowish-brown silt loam substratum.

Minor soils, including Stronghurst and others, occupy about 20 percent of the association. Stronghurst is somewhat poorly drained, with a light-colored silt loam surface horizon and a brown silty clay loam subsoil mottled with gray and yellow. The underlying substratum is mixed pale brown and yellowish-brown silt loam.

The Rozetta-Fayette Soil Association is primarily cropped to corn and soybeans, but some areas are used for pasture or woodland. Rozetta and Fayette are generally well suited for urban and recreational purposes. A seasonally high water table and moderately slow permeability limit the use of Stronghurst for some purposes.

F. Fayette-Rozetta Association, 4-12 percent slopes. This association occupies about 3 percent of Brown County. Moderately and strongly sloping, it lies on ridge tops and side slopes of drainageways in the eastern part of the county. The largest area is near Versailles, with smaller areas lying to the north and northeast. Soils of the association are light-colored and formed from loess over clay loam till (Fig. 3).

Fayette soils occupy about 60 percent of the association. They are mostly strongly sloping and lie on side slopes of drainageways, but occasionally they are found on moderately sloping ridges. They occur on



E		F		G		H		I		J	
278	Stronghurst, 0-4%	19	Sylvan, 4-12%	8	Hickory, 12+%	132	Starks, 0-2%	71	Darwin, 0-2%	304	Landes, 0-2%
279	Rozetta, 0-4%	279	Rozetta, 4-12%	19	Sylvan, 12+%	134	Camden, 2-4%	83	Wabash, 0-2%	331	Haymond, 0-2%
280	Fayette, 2-4%	280	Fayette, 4-12%	280	Fayette, 12+%	148	Proctor, 2-4%	107	Sawmill, 0-2%	333	Wakeland, 0-2%
				551	Gosport, 12+%	150	Onarga, 2-4%	333	Wakeland, 0-2%	334	Birds, 0-2%
						219	Millbrook, 0-2%	425	Titus, 0-2%		
						344	Harvard, 0-4%	451	Lawson, 0-2%		

Soil landscape relationships of Soil Associations E, F, G, H, I, and J. **(Fig. 3)**

more sloping topography than the Fayette soils described under Soil Association E but are similar in other characteristics.

Rozetta soils make up about 30 percent of the association. They are moderately and strongly sloping, occupying side slopes of drainageways and ditches. These soils are similar in most characteristics to the Rozetta soils described under Soil Association E, but are somewhat more sloping.

Minor soils, including Sylvan and other soils, occupy about 10 percent of the association. Sylvan soils are well drained and are strongly sloping. They have silt loam surface layers except where erosion has been severe. The subsoil is silty clay loam and is underlain by a silt loam substratum that is high in lime.

The Fayette-Rozetta Association is used mainly as cropland with corn and soybeans as the principal crops. Some areas are used for pasture and woodland. The sloping topography that predominates in the association limits the use of these soils for some agricultural, urban, and recreational uses.

G. Fayette-Hickory Association, slopes greater than 12 percent. This association occupies about 10 percent of Brown County. It occurs in the eastern part, extending from Ripley in the north to the Pike County line in the south. Moderately steep to very steep, it lies on hillsides and on slopes along drainageways. Fayette soils formed in more than 10 feet of loess and Hickory in clay loam glacial drift (Fig. 3).

Fayette soils make up about 50 percent of the association. They are moderately steep to steep, and thus are more sloping than the Fayette soils of Areas E and F. Otherwise they are similar to the Fayette soils described under Association E.

Hickory soils occupy about 30 percent of the association. They are mainly steep to very steep and are commonly below the Fayette soils on the lower parts of slopes. They are described under Association D.

About 20 percent of the association consists of Sylvan, Gosport, and other minor soils, as well as some areas of limestone rockland. Sylvan soils are described under Area F, and Gosport soils, under Area D. Limestone rockland is mainly rock on the surface but in places it is covered by a thin silty or loamy surface layer.

Because of the steep slopes, this association is used primarily for pasture and woodland. It is also well suited for wildlife. Features such as steep slopes and moderately slow permeability severely limit the soils of this association for most urban and recreational purposes.

H. Harvard-Millbrook Association, 0-4 percent slopes. This is the smallest association in the county, occupying about 2 percent of the total area. It is nearly level to gently sloping, lying on terraces of the Illinois and LaMoine Rivers and McKee Creek. The soils are dark and were formed from thin layers of loess or silty materials overlying silty and sandy sediments (Fig. 3).

Harvard soils make up about 35 percent of the association. They are nearly level to gently sloping and are well or moderately well drained. The surface layer is a very dark grayish-brown silt loam and the subsurface layer, a brown silt loam. A dark yellowish-brown subsoil is underlain by a substratum of mixed layers of yellowish-brown loam, sandy loam, and sand.

Millbrook soils occupy about 50 percent of the association. They are nearly level and are somewhat poorly drained. A very dark grayish-brown silt loam surface layer overlies a grayish-brown silt loam subsurface horizon. The subsoil is brown and grayish-brown silty clay loam, clay loam, or sandy clay loam mottled with strong brown. Mixed layers of yellowish-brown sandy loam, silt loam, loam, and clay loam form the underlying substratum.

Minor soils are Proctor, Onarga, Camden, Starks, and others. They occupy about 15 percent of the association. Proctor is well to moderately well drained, with a silt loam surface horizon and a silty clay loam subsoil. The substratum is mixed layers of loam and sandy loam. Camden is light in color but otherwise similar to Proctor. Starks is similar to Camden except that it is somewhat poorly drained. Onarga is well or moderately well drained. It has a dark-colored fine sandy loam surface layer, a sandy loam or fine sandy loam subsoil, and a substratum of loamy fine sand and sand.

The Harvard-Millbrook Soil Association is used for intensive production of corn and soybeans. Flood hazard due to runoff from nearby upland, the porous underlying loam and sandy layers, slight wetness, and susceptibility to frost heaving limit the use of some soils of the association for most urban and recreational purposes. Effluent from septic tank filter fields may move through the coarse-textured substratum and contaminate ground water.

Level soils in foreground are part of Soil Association H; rolling soils in background are Association G. (Fig. 4)

I. Titus-Sawmill-Wakeland Association, 0-2 percent slopes. Occupying about 4 percent of the county, this association lies on nearly level bottomland along the Illinois River. The soils are protected from overflow by levees except for an area extending 1 mile north to 2 miles south of the LaGrange Lock and Dam. These dark and light-colored soils have formed from silty and clayey alluvial sediments deposited by overflow from the Illinois and LaMoine Rivers (Fig. 3).

Titus soils, which make up about 35 percent of the association, are poorly drained. The surface layer is a black silty clay loam or silty clay; the subsoil is gray or dark gray silty clay loam or silty clay mottled with olive and brown; and the substratum is gray silty clay loam, sandy loam, and sand mottled with brown.

Sawmill soils occupy about 30 percent of the association. These poorly drained soils have a black silty clay loam surface layer underlain with a dark gray silty clay loam subsoil mottled with brown. Mixed layers of gray and light olive-brown silty clay loam, silt loam, or sandy loam underlie the subsoil.

Wakeland soils make up about 20 percent of the association. They are somewhat poorly drained and are light in color. The surface layer is a brown silt loam mottled with gray and brown. The subsoil is a grayish-brown silt loam, also mottled with gray and brown. The substratum consists of mixed yellowish-brown silt loam and sandy loam layers mottled with gray and brown.

Minor soils are Darwin, Wabash, Lawson, and others. They occupy about 15 percent of the association. Darwin soils are dark and poorly drained, and have a silty clay texture. Wabash soils are similar to Darwin except that they have a thicker, darker surface layer. Dark-colored Lawson soils have a silt loam surface layer and subsoil and a silt loam or silty clay loam substratum.

The Titus-Sawmill-Wakeland Association is used mainly as cropland with corn and soybeans as the principal crops. Use of the area for most urban and recreational purposes is severely limited by overflow hazard, wetness, high clay content, or slow permeability.

J. Haymond-Wakeland Association, 0-2 percent slopes. Occupying about 5 percent of the county, this association lies on nearly level bottomland. It

Table 2. — Features of Brown County Soils

Soil association area	Soil series	Percent slope	Percent organic matter	Texture[a] Surface	Texture[a] Subsoil	Internal drainage and aeration	Profile permeability	Water erosion hazard	Lime group[b]	Phosphorus supplying power[b]	Potassium supplying power[b]
A	Virden	0–2	5.0–5.5	sil–sicl	*sicl*	Poor	Moderately slow	Slight	A	Low	Medium
	Ipava	0–2	4.5	sil	sicl	Somewhat poor	Moderate	Slight	B	Medium	High
	Clarksdale	0–4	2.5	sil	*sicl*	Somewhat poor	Moderately slow	Slight	C	Medium	Medium
	Herrick	0–2	3.5	sil	*sicl*	Somewhat poor	Moderately slow	Slight	B	Medium	Medium
	Sicily	4–12	2.5	sil	*sicl*	Moderately good–good	Moderate	Moderate–severe	C	High	Medium
	Tama	4–12	3.5	sil	sicl	Moderately good–good	Moderate	Moderate–severe	B	High	High
B	Keomah	0–4	2.0	sil	*sicl*	Somewhat poor	Moderately slow	Slight	C	High	Medium
	Clinton	2–4	2.0	sil	*sicl*	Moderately good–good	Moderately slow	Slight	C	High	Medium
	Rushville	0–2	2.0	sil	*sicl*–sic	Poor	Slow–very slow	Slight	C	Medium	Low
	Clarksdale	0–4	2.5	sil	*sicl*	Somewhat poor	Moderately slow	Slight	C	Medium	Medium
C	Clinton	4–12	2.0	sil	*sicl*	Moderately good–good	Moderately slow	Moderate	C	High	Medium
	Atlas	7–12	2.0	sil	sic–*sicl*	Somewhat poor	Very slow–slow	Severe	C	Low	Low
	Fishhook	7–12	2.0	sil	*sicl*–sic	Somewhat poor	Slow–very slow	Severe	C	Low	Low
	Keller	7–12	4.0	sil	*sicl*–sic	Somewhat poor	Slow	Severe	C	Low	Low
	Hickory	7–12	1.5	l	cl	Moderately good–good	Moderate–moderately slow	Moderate	D	Low	Low
D	Hickory	12+	1.5	l	cl	Moderately good–good	Moderate–moderately slow	Severe	D	Low	Low
	Clinton	12+	2.0	sil	*sicl*	Moderately good	Moderately slow	Severe	C	High	Medium
	Gosport	12+	2.0	sil	sic–c	Good	Very slow	Very severe	C	Low	Low
	Marseilles	12+	2.0	sil	sicl	Good–moderately good	Slow–very slow	Very severe	C	Low	Low
	El Dara	12+	2.0	sil	cl–c	Moderately good	Slow–moderate	Severe	D	Low	Low
E	Rozetta	0–4	2.0	sil	sicl	Moderately good	Moderate	Slight	C	High	Medium
	Fayette	2–4	2.0	sil	sicl	Good	Moderate	Slight	C	High	Medium
	Stronghurst	0–2	2.0	sil	sicl	Somewhat poor	Moderate	Slight	C	High	Medium
F	Fayette	4–12	2.0	sil	sicl	Good	Moderate	Moderate	C	High	Medium
	Rozetta	4–12	2.0	sil	sicl	Moderately good	Moderate	Moderate	C	High	Medium
	Sylvan	4–12	2.0	sil	sicl	Good	Moderate	Moderate	C	Medium	Medium
G	Fayette	12+	2.0	sil	sicl	Good	Moderate	Severe	C	High	Medium
	Hickory	12+	1.5	sil	sicl	Moderately good–good	Moderate	Severe	D	Low	Low
	Sylvan	12+	2.0	sil	sicl	Good	Moderate	Severe	C	Medium	Medium
	Gosport	12+	2.0	sil	sic–c	Good	Very slow	Very severe	C	Low	Low
H	Harvard	0–4	2.5	sil	sicl–cl	Moderately good–good	Moderate	Slight	C	Medium	Medium
	Millbrook	0–2	3.0	sil	sicl	Somewhat poor	Moderate–moderately slow	Slight	B	Medium	Medium
	Proctor	2–4	3.5	sil	sicl	Moderately good–good	Moderate	Slight	B	Medium	Medium
	Onarga	2–4	3.0	fsl	sl–scl	Good	Moderately rapid–rapid	Slight	C	Low	Low
	Camden	2–4	2.0	sil	sicl–cl	Good	Moderate	Slight	C	Medium	Medium
	Starks	0–2	2.0	sil	sicl–cl	Somewhat poor	Moderate–moderately slow	Slight	C	Medium	Medium
I[c]	Titus	0–2	5.5	sicl–sic	sicl	Poor	Slow	Slight	A	Medium	Medium
	Sawmill	0–2	4.5	sicl	sicl	Poor	Moderate	Slight	A	Medium	Medium
	Wakeland	0–2	1.5	sil	sil	Somewhat poor	Moderate	Slight	C	High	Medium
	Darwin	0–2	3.5	sic	sic–c	Poor	Very slow	Slight	A	High	Medium
	Wabash	0–2	4.5	sic	sic	Poor	Slow–very slow	Slight	A	Medium	Medium
	Lawson	0–2	4.0	sil	sil	Somewhat poor	Moderate	Slight	B	High	Medium
J[c]	Haymond	0–2	1.5	sil	sil	Good–moderately good	Moderate	Slight	C	High	Medium
	Wakeland	0–2	1.5	sil	sil	Somewhat poor	Moderate	Slight	C	High	Medium
	Landes	0–2		fsl	fsl	Good	Moderately rapid–rapid	Slight	D	Low	Low
	Birds	0–2	1.5	sil	sil	Poor	Slow–moderately slow	Slight	C	Medium	Medium

[a] cl, clay loam; fsl, fine sandy loam; l, loam; sic, silty clay; sil, silt loam; sicl, silty clay loam; *sicl*, "heavy" silty clay loam.
[b] Lime Group, phosphorus supplying power and potassium supplying power are useful in interpreting soil test results. See the Agronomy Handbook for necessary information.
[c] Soils in Soil Associations I and J are subject to periodic flooding.

occurs as long, narrow areas less that a mile wide along the LaMoine River, the McKee Creek, and other major creeks. On the flood plain of the Illinois River, two areas extend from the bluff eastward for about ½ mile. The light-colored soils of the association formed from silty alluvial sediments (Fig. 3).

Haymond soils occupy about 40 percent of the association. Haymond is well to moderately well drained and has a grayish-brown silt loam surface layer. The subsoil is dark brown and brown silt loam. The substratum consists of layers of brown silt loam and sandy loam mottled with gray.

Wakeland soils occupy another 40 percent of the association. They were described under Soil Association Area I.

Landes, Birds, and other minor soils occupy about 20 percent of the association. Landes is a well-drained soil with a fine sandy loam surface layer and underlying layers of fine sandy loam, silt loam, loam, and sandy clay loam. Birds is poorly drained and has silt loam surface, subsoil, and substratum horizons.

The Haymond-Wakeland Association is used mainly as cropland with corn and soybeans as the principal crops. In some areas the soils lie in narrow bands between the stream and steep uplands. Such areas are used for pasture or woodland. Features such as overflow, hazard, and slight to severe wetness of the soils severely limit use for most urban and recreational purposes. Effluent from septic tank filter fields may contaminate ground water.

SOIL FEATURES OF BROWN COUNTY

Brown County soils vary in their suitability for different uses. Some soils have only slight limitations and others severe limitations for a particular use such as cropland. Soil features that influence the use and management of Brown County soils are given in Table 2 and are discussed below.

Percent slope is the gradient or the vertical rise or fall in feet in a horizontal distance of 100 feet. As percent slope increases, more water will run off, causing a greater erosion hazard, and less water will enter the soil to be stored for use by plants. Machinery will also be harder to operate. Campers will find it difficult to pitch a tent on slopes steeper than 12 percent.

Percent organic matter measures the part of the soil that is made up of the remains of living matter — plants and animals. As the organic matter decays, it releases nutrients such as nitrogen and phosphorus for use by plants. Organic matter helps bind soil particles together, increasing the stability of soil structure and decreasing susceptibility to breakdown by raindrop impact, to surface crusting, and to water erosion. Organic matter content also influences herbicide effectiveness. Estimates of organic matter in Table 2 may be used for adjusting herbicide rates given in the Illinois Weed Control Guide. The influence of organic matter content on lime requirement is discussed in the section on lime groups (page 12).

Soil texture refers to the relative proportion of sand, silt, and clay in a soil. Silt loam surface layers predominate in Brown County although some soils have silty clay, silty clay loam, loam, or fine sandy loam surface horizons. Silt loam surface layers are easy to work and have high water-holding capacity. However, they are erosive, crust rather easily, and are subject to frost heaving. Silty clay and silty clay loam surface layers are sticky and plastic when wet and hard when dry and thus have poor workability. Loam and fine sandy loam soils are easy to work but have lower water-holding capacity than silt loam, silty clay loam, or silty clay soils.

Silty clay loam subsoils predominate in Brown County. The clay content slows the rate of water movement through the profile, especially in subsoils that are "heavy" silty clay loam (designated *sicl* in Table 2). In some areas the silty clay loams and finer textured subsoils have been exposed by erosion or earth-moving equipment. These areas are sticky and plastic when wet and hard when dry, and are difficult to work. Silty clay loam and finer textured material have high shrink-swell potential, which can cause streets, highways, and building foundations to crack.

Some soils of the bottomland areas have silt loam subsoil horizons. Silt loam is difficult to compact because the silt particles do not hold together when dry and they flow as a thick liquid when wet. Frost heaving may also be a problem if the subsoil is exposed. Small tunnels called "pipes" may develop in an embankment formed from very silty soil material. High silt material underlies the subsoils in soil association areas A, B, E, and F.

Natural drainage and aeration refers to the downward movement of water through a soil profile and its replacement by air. It indicates the degree to which a soil is saturated with water under natural conditions. Soils with poor natural drainage and aeration are saturated much of the time. If natural drainage and aeration are somewhat poor, the saturated zone is in the upper B horizon during the wet seasons of the year. Moderately well-drained soils have saturated conditions in the lower B horizons during wet seasons, while in

well-drained soils the saturated zone is nearly always below the B horizon. Planting, cultivating, and harvesting are delayed more frequently on poorly drained soils than on those with better drainage. Soils with saturated layers at or near the surface have severe limitations for building sites or septic tank filter fields. Tile and surface drainage systems are used to improve the natural drainage and aeration of many soils. The effectiveness of drainage improvements is determined by the rate of water movement through the soil.

Profile permeability refers to the rate of water movement through the soil profile. Brown County soils with moderately rapid or rapid permeability usually do not need drainage improvement but they are often drouthy. Soils with moderate and moderately slow permeability can be effectively drained with tile drain systems. Tile drains are usually ineffective on soils with slow or very slow permeability. On sloping soils, runoff increases as profile permeability decreases, so soils with restricted profile permeability are often subject to severe water erosion. Soils with moderately rapid or rapid permeability are often subject to severe wind erosion. Most Brown County soils have moderate to moderately slow permeability. Some upland soils, however, are slowly or very slowly permeable, and some soils in association areas H and J have moderately rapid to rapid permeability. Moderate profile permeability is preferred for most soil uses.

Water erosion hazard refers to the degree of susceptibility to excessive water erosion. The hazard of water erosion increases as percent slope increases and as profile permeability decreases. Ratings of slight, moderate, severe, or very severe are used. Soils with a slight erosion hazard have a rather wide range of uses without excessive erosion. Soils with a severe erosion hazard are subject to excessive erosion unless a carefully designed erosion control system is used.

Lime group can be used as an aid in interpreting soil tests as reported on Soil Test Form D-2. Soils in Lime Group A are dark (high organic matter) silty clays and silty clay loams. Some Group B soils are light (low organic matter) and moderately dark (medium organic matter) silty clays and silty clay loams. Others are dark (high organic matter) silt loams and clay loams. Group C soils are light and moderately dark silt loams and clay loams; dark sandy loams; or dark and moderately dark loams. Group D soils are light-colored loams; light and moderately dark sandy loams; and all sands. The color and texture refer to the plow layer characteristics.

Phosphorus-supplying power refers to a soil's ability to provide phosphorus for use by plants. Soils in Brown County that formed from loess and are well drained have high phosphorus-supplying power. Yield increases from applications of phosphorus fertilizer are likely to be small on these soils. Phosphorus-supplying power decreases as natural drainage and aeration decrease. Soils that developed from thin loess, glacial till, or bedrock are usually low in phosphorus-supplying power. Soils that occur on the terraces and bottomlands are variable in this ability.

Potassium-supplying power refers to a soil's ability to provide potassium for use by plants. The potassium-supplying power of a soil decreases as weathering of the soil increases. Brown County soils that developed under prairie vegetation are usually higher in potassium-supplying power than their forested associates. Glacial till and sandy soils are usually low in this power.

Lime group, phosphorus-supplying power, and potassium-supplying power can be used as aids in interpreting soil test results. Additional information is available in the Agronomy Handbook and on Soil Test Report Forms D-1, D-2, D-3, and D-4.

Flood hazard is not listed as a separate column entry in Table 2. Soils of Associations I and J occur on the floodplains and are subject to periodic flooding. Flash flooding occurs at intervals in the small stream valleys. Rapid snow melt and heavy, extended rains cause occasional flooding along the Illinois River. This flooding may in turn cause water to back up in the tributary streams. Drainage and levee improvements have increased the soil use potential of many of the bottomland areas. However, a continuing soil-use limitation exists, especially for many nonagricultural purposes. The limitations are less severe for agricultural and wildlife uses.

CROP YIELD ESTIMATES

Most Brown County soils are used for crop production. The soil features listed in Table 2 influence the yielding ability of the soils. Table 3 gives estimated crop yields for commonly grown crops. The yields are those that can be expected under a high level of management on soils that are not eroded or flooded. High management includes drainage improvement, erosion control, the use of lime and fertilizer, and other improved cultural practices. Additional information on the effect of soil properties, management inputs, and other factors on crop yields are given in Illinois Extension Circular 1016, *Productivity of Illinois Soils*.

Table 3. — Estimated Crop Yields Under a High Level of Management[a]

Soil association area	Soil series	Percent slope	Estimated crop yields per acre					
			Corn, bu.	Soybeans, bu.	Wheat, bu.	Oats, bu.	Alfalfa hay, tons	Mixed pasture, days[b]
A	Virden	0–2	124	42	51	66	4.7	235
	Ipava	0–2	142	47	57	83	5.5	275
	Clarksdale	0–4	122	39	50	72	4.8	240
	Herrick	0–2	123	41	53	71	5.0	250
	Sicily	4–7	101	33	44	62	4.1	207
	Tama	4–12	128	40	51	77	5.1	256
B	Keomah	0–2	112	35	45	65	4.6	230
	Clinton	2–4	110	35	46	65	4.6	230
	Rushville	0–2	99	33	41	58	3.8	190
	Clarksdale	0–4	122	39	50	72	4.8	240
C	Clinton	4–12	104	34	44	62	4.4	220
	Atlas	7–12	45	16	18	29	2.0	100
	Fishhook	7–12	50	18	20	31	2.1	110
	Keller	7–12	76	27	33	47	3.3	166
	Hickory	7–12	57	20	22	33	2.3	116
D	Hickory	12+	54	18	21	31	2.2	110
	Clinton	12+	94	30	40	56	4.0	198
	Gosport	12+	NA	NA	NA	NA	1.4	70
	Marseilles	12+	NA	NA	NA	NA	2.8	140
	El Dara	12+	NA	NA	NA	NA	2.0	100
E	Rozetta	0–4	114	36	47	66	4.6	230
	Fayette	2–4	111	35	47	66	4.6	230
	Stronghurst	0–2	120	38	48	69	4.8	240
F	Fayette	4–12	106	33	45	63	4.4	220
	Rozetta	4–12	108	34	45	63	4.4	220
	Sylvan	12+	79	22	32	45	3.3	167
G	Fayette	12+	100	31	42	60	4.2	218
	Hickory	12+	54	18	21	31	2.2	198
	Sylvan	12+	79	22	32	45	3.3	167
	Gosport	12+	NA	NA	NA	NA	1.4	70
H	Harvard	0–4	115	37	47	71	4.7	235
	Millbrook	0–2	125	39	51	74	4.9	245
	Proctor	2–4	125	40	51	80	5.0	250
	Onarga	2–4	94	34	42	61	3.8	190
	Camden	2–4	106	35	45	64	4.5	225
	Starks	0–2	112	36	48	65	4.6	230
I	Titus	0–2	100	33	37	51	3.5	175
	Sawmill	0–2	125	41	46	67	4.9	245
	Wakeland	0–2	113	38	48	65	4.6	230
	Darwin	0–2	89	31	36	49	3.2	160
	Wabash	0–2	92	33	37	51	3.4	170
	Lawson	0–2	130	42	52	73	5.1	255
J	Haymond	0–2	118	39	50	68	4.7	235
	Wakeland	0–2	113	38	48	65	4.6	230
	Landes	0–2	82	29	36	53	3.3	165
	Birds	0–2	102	36	43	62	3.9	195

[a] Adapted from Illinois Extension Circular 1016, "Productivity of Illinois Soils."
[b] Expected number of days that one acre will carry one cow.
NA = not adapted.

SOIL LIMITATIONS FOR SELECTED USES

The features that limit use of Brown County soils are the ones that influence or are influenced by soil-water relationships. These include flood hazard plus all the features listed in Table 2 except lime group and phosphorus- and potassium-supplying power. Lime and nutrients are needed on most Brown County soils but are relatively easy to provide with applications of agricultural limestone, commercial fertilizers, animal manure, green manure, and crop residues.

Table 4 gives the extent to which soil features limit the use of Brown County soil association areas for various purposes. Three degrees of limitation are given — slight, moderate, and severe. Since variations may occur within an area, the ratings may not apply to every site. On-site inspection with the soil ratings as a guide will provide a basis for soil use decisions.

Some factors other than soil features influence soil use. As a result, a site may be used for a particular purpose even though the soil has a moderate or severe rating. For example, the natural beauty or seclusion of a steep wooded area may make it desirable for a home site even though slope and erosion hazards may present difficulties in site development.

Each use listed in Table 4 is discussed in the following paragraphs.

Cropland ratings are based on the productivity of the soil for commonly grown crops and on the frequency with which row crops (corn and soybeans) can be grown. Limitations are rated as *slight* if yields are relatively high under high management (120 bushels per acre or more of corn) and if row crops can be grown nearly every year without excessive erosion. A *severe* rating means that yields are low under high management (less than 100 bushels per acre of corn) or that row crops can be grown only one year in four or less often because of a water erosion hazard. A *moderate* rating is given for limitations between these extremes.

Permanent pasture ratings are based on grass and legume seedings for improved pastures. The erosion control provided by close-growing meadow crops is taken into account.

Tree and shrub ratings refer to landscape plantings. Percent slope, natural drainage and aeration, profile permeability, erosion hazard, and flood hazard are limiting features.

Septic tank filter fields should permit downward movement of effluent through the soil. Percent slope, internal drainage and aeration, profile permeability, and flood hazard are limiting soil features.

Sewage lagoons are designed to hold water in a small pond so that bacterial decomposition will render the effluent harmless and liquid will be lost through evaporation. Percent slope, excessive profile permeability, and flood hazard are limiting features.

Pond site ratings are given for use of soils as *reservoir areas* and as *embankment materials*. In Brown County many good pond sites exist. Flood hazard is a limiting soil feature for reservoir sites. Embankment material should be compactible and not subject to "piping." Surface and subsoil texture are regarded as limiting soil features in Areas I and J.

Table 4. — Estimated Soil Limitations for Selected Uses

Soil association area	Percent of county	Degree soil features limit use of soil association area[a]										
		Cropland	Permanent pasture	Trees and shrubs	Sewage disposal: Septic tank filter fields	Sewage disposal: Sewage lagoons	Pond sites: Reservoir areas	Pond sites: Embankment materials	Recreation: Camping and picnic areas	Recreation: Playgrounds	Streets and highways	Buildings
A	12	SL 5	SL	SL 5	M-S 5,6	SL	SL	SL	M 5	M 5	M 4,5	M 5
B	19	M 2,7	SL	SL	SL	SL	SL	SL	SL	SL	SL	SL
C	7	S 1,2,6,7	M 1,6	SL	M 1,6	M 1	SL	SL	M 1,6,7	M 1,6,7	M 1,4,7	M 1,7
D	35	S 1,2,7	S 1,6	M 1,6,7	S 1,6	S 1	SL	SL	S 1,7	S 1,7	S 1,4,7	S 1,6,7
E	3	M 2,7	SL	SL	SL	SL	SL	SL	SL	SL	SL	SL
F	3	S 1,2,7	SL 1,6	SL	SL	M 1	SL	SL	M 1	M 1	M 1,7	M 1,7
G	10	S 1,2,7	S 1,6	M 1,7	S 1	S 1	SL	SL	S 1	S 1	S 1,7	S 1,7
H	2	SL	SL	SL	M 5,6	M 6	SL	SL	SL	SL	SL	SL
I	4	M 3,5,8	S 8	M 5,8	S 5,8	S 8	M 8	S 3,4	S 8	S 8	S 4,5,8	S 5,8
J	5	M 8	M 8	SL 8	S 8	S 8	M 8	M 3,4	S 8	S 8	S 4,8	S 8

[a] Limiting soil features: 1, percent slope; 2, percent organic matter; 3, surface texture; 4, subsoil texture; 5, internal drainage and aeration; 6, profile permeability; 7, erosion hazard; 8, flood hazard.

Degree of limitation: SL = slight (relatively free of limitations or has limitations that are easily overcome). M = moderate (limitations that need to be recognized but can be reduced with careful planning and design. S = severe (limitations are severe enough to make use questionable; exceptionally careful planning is necessary).

Recreation ratings are given for use of soils as *camping and picnic areas* and as *playgrounds*. Percent slope, internal drainage and aeration, profile permeability, erosion hazard, and flood hazard are limiting features.

Highway and street site ratings are based on percent slope, subsoil texture, internal drainage and aeration, erosion hazard, and flood hazard.

Building site ratings refer to limitations for homes and other relatively small buildings. Percent slope, internal drainage and aeration, profile permeability, erosion hazard, and flood hazard are limiting features. The most desirable building sites have good surface drainage but don't have excessively steep slopes that cause erosion problems.

SOIL MANAGEMENT

Soil management suggestions for Brown County Soil Associations are given in this section and in Table 5. The suggestions are general and may need to be modified to fit the soil landscape of a particular tract. For assistance in developing soil use plans, contact the Brown County Extension Adviser or the Soil Conservation Service District Conservationist.

Row Crop Intensity

Row crops — primarily corn and soybeans — are grown on nearly 60 percent of Brown County cropland (*Illinois Soil and Water Conservation Needs Inventory*, 1970). Susceptibility to water erosion is the primary soil factor that limits row crop intensity. Erosion susceptibility increases as percent slope in-

Table 5. — Soil Management Practices for Soil Associations of Brown County

Soil association area	Row crop intensity, percent	Wind erosion control	Water erosion control	Other tillage practices	Drainage improvement
A	75–100	Delayed tillage after soybeans; fall-seeded cover crops; conservation tillage	Conservation tillage, contouring	Fall-plow dark silty clay loam after corn, small grain, or meadow	Tile drainage
B	75–100	Not usually a problem	Conservation tillage, contouring	Reduced tillage to minimize surface crusting	Surface drainage, tile drainage
C	25–75	Not usually a problem	Conservation tillage, rotations, contouring, terraces, contour strip cropping	Reduced tillage to minimize surface crusting	Interceptor tile for lateral seepage
D	<25	Not usually a problem	Permanent vegetation, rotations, contouring, conservation tillage, contour strip cropping	Reduced tillage to minimize surface crusting	Not usually needed
E	75–100	Not usually a problem	Conservation tillage, contouring	Reduced tillage to minimize surface crusting	Not usually needed
F	25–75	Not usually a problem	Conservation tillage, contouring	Reduced tillage to minimize surface crusting	Not usually needed
G	<25	Not usually a problem	Permanent vegetation, rotations, contouring, conservation tillage, contour strip cropping	Reduced tillage to minimize surface crusting	Not usually needed
H	75–100	Delayed tillage after soybeans and on sandy soils; fall-seeded cover crops; conservation tillage	Conservation tillage, contouring	Not usually a problem	Tile drainage
I	75–100	Delayed tillage after soybeans; fall-seeded cover crops	Not usually a problem	Fall-plow dark silty clay and silty clay loams after corn, small grain, or meadow	Levees and diversions, surface drainage
J	75–100	Delayed tillage after soybeans and on sandy soils; fall-seeded cover crops; conservation tillage	Not usually a problem	Reduced tillage to minimize surface crusting	Diversions and levees, surface drainage, tile drainage

creases. Table 5 indicates three degrees of row crop intensity for the various soil associations: 75-100 percent, 25-75 percent, and less than 25 percent. Row crop intensity less than that indicated may be used with reduced danger from erosion.

Wind Erosion Control

Wind erosion is not generally a problem in Brown County. However, it is a hazard on fall-plowed or disked soybean stubble and sandy soils like Onarga (Area H) and Landes (Area J). Wind erosion can be alleviated by using conservation tillage, such as chisel-plow or zero-till systems; by seeding oats or rye as cover crops in the fall; or by delaying tillage operations until spring.

Water Erosion Control

Water erosion is a major soil-management concern in much of Brown County, especially in Areas C, D, F, and G. With intensive row crop production, water erosion may also be severe on slopes of more than 2 percent in Areas A, B, E, and H. Water erosion can be controlled by one or more of these methods: crop rotations that include meadow crops at least one year in four, conservation tillage, contouring, terracing, strip-cropping, and permanent vegetation.

Other Tillage Practices

Tillage practices other than conservation tillage systems may be beneficial on some soils. Fall plowing may aid early planting of corn and soybeans on soils such as Virden (Area A) and Sawmill (Area I). However, if the previous crop was soybeans, fall plowing or disking will create a potentially severe wind erosion hazard. Reduced tillage systems (plow-plant, cultivator-plant, and others) will help minimize soil crusting especially on low organic-matter soils such as those in Areas B, C, E, F, and J.

Drainage Improvement

Drainage improvement of Brown County soils involves removal of excess water through tile drains, surface drainage, interceptor tile lines for lateral seepage, and diversions that direct water away from an area. Landscape position, percent slope, internal drainage and aeration, and profile permeability determine the need for and effectiveness of drainage improvements. Additional information on drainage needs of Illinois soils is given in the *Drainage Guide for Illinois,* available through the Brown County extension adviser. Technical assistance for designing drainage systems may be obtained through the district conservationist and the Brown County Soil and Water Conservation District.

Lime and Fertilizer Requirements

Lime and fertility needs vary between different Brown County soils. Properly interpreted soil tests provide an excellent guide for efficient lime and fertilizer use. The Brown County extension adviser will provide necessary soil-sampling instructions.

Other Cultural Practices

Weed-, insect-, and disease-control practices help prevent these pests from taking the profit out of an otherwise efficient crop production system. Attention must also be given to variety selection, time and method of planting, and plant population. The *Illinois Agronomy Handbook,* available from your extension adviser, gives valuable information on these and related subjects.

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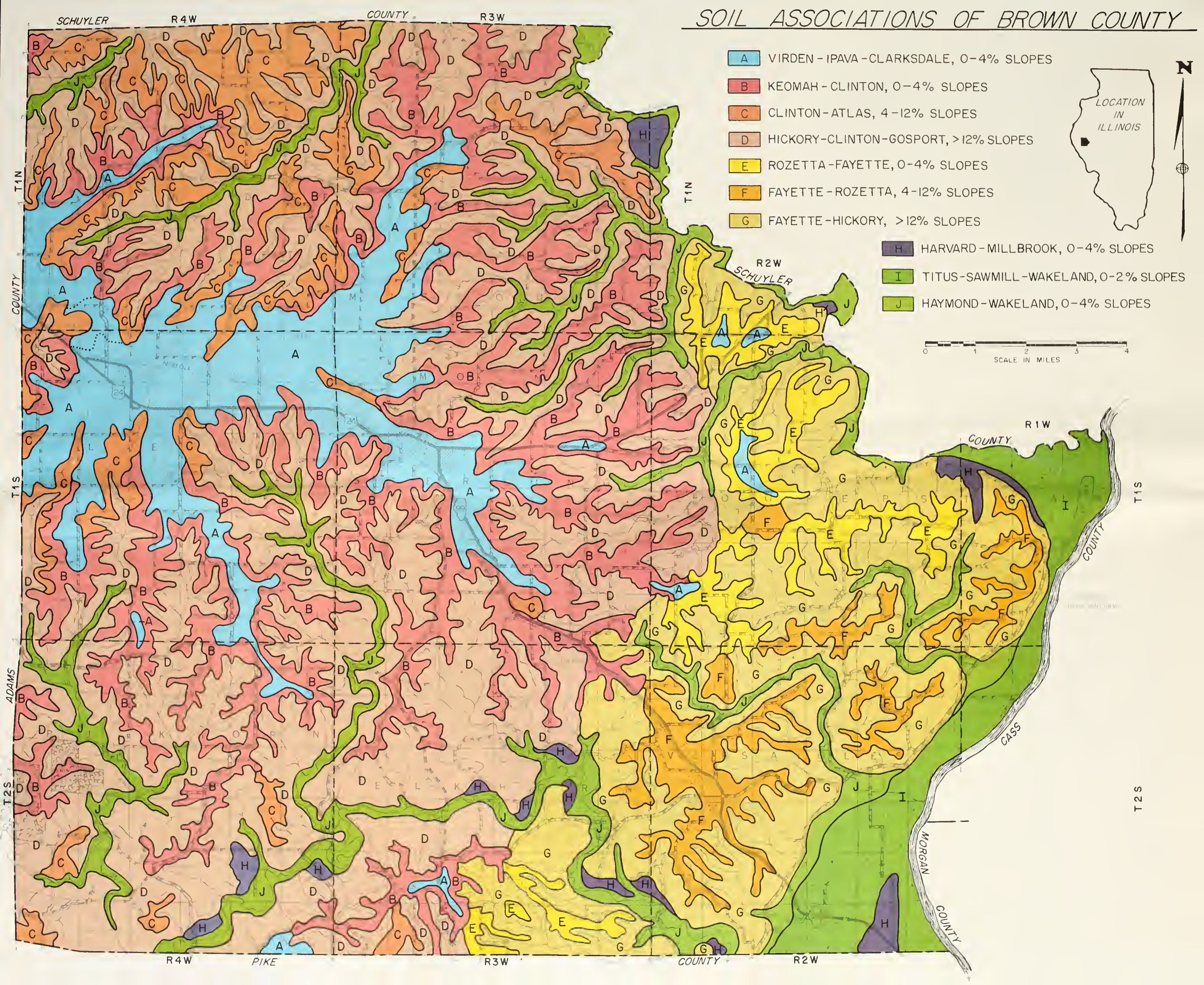
SOIL ASSOCIATIONS OF BROWN COUNTY
A VIRDEN - IPAVA - CLARKSDALE, 0-4% SLOPES
B KEOMAH - CLINTON, 0-4% SLOPES
C CLINTON - ATLAS, 4-12% SLOPES
D HICKORY - CLINTON - GOSPORT, >12% SLOPES
E ROZETTA - FAYETTE, 0-4% SLOPES
F FAYETTE - ROZETTA, 4-12% SLOPES
G FAYETTE - HICKORY, >12% SLOPES
H HARVARD - MILLBROOK, 0-4% SLOPES
I TITUS - SAWMILL - WAKELAND, 0-2% SLOPES
J HAYMOND - WAKELAND, 0-4% SLOPES
LOCATION IN ILLINOIS
N
0 1 2 3 4
SCALE IN MILES
SCHUYLER COUNTY
R4W
R3W
R2W
R1W
T1N
T1S
T2S
ADAMS COUNTY
PIKE COUNTY
CASS COUNTY
MORGAN COUNTY